

Institution		Agency Code	
Western Washington University		3800	
Project Title		Category of Project	Project Number
Network Infrastructure/Switches		Infrastructure	30000011
County	City	Legislative District	
Whatcom	Bellingham	40	
Was this project included in a prior 10-year capital plan? If yes, when?			Previous Project Number
Yes, as part of Aggregated Intermediate: Safety and Risk Reduction projects			2008-1-100
Prepared By:		Phone Number	Analysis Date:
Renée Roberts, Capital Budget Director		360-650-2875 Email: Renee.Roberts@wwu.edu	August 15, 2008

1. Project Schedule:

	Start Date	Complete Date
Pre-design	N/A	N/A
Design	September 2009	May 2010
Bid	June 2010	June 2010
Construction/Occupancy	July 2010	October 2010

2. Problem Statement (short description of the project – the needs and the benefits):

This project impacts the University’s entire data communications network infrastructure including building data switch capacity and between-building fiber network connections. The university has a total of 148 Cisco 4003 switches in service at this time. Cisco Systems, the manufacturer of this equipment, issued an “end-of-life” (EOL) announcement on July 26, 2004. (See Appendix B) This announcement notified owners that software support for this equipment was discontinued on July 26, 2005 and hardware support is scheduled to be terminated on July 26, 2009. Operating a sophisticated academic and administrative network with equipment that cannot be repaired easily jeopardizes our ability to provide appropriate levels of support to students, faculty, staff, and the public.

The scope of this project includes:

- a. Replacing the aging Cisco Systems Catalyst 4003 network switches designed and installed under the Integrated Signal Distribution System (ISDS) project between 1998 and 2000;
- b. Rewiring equipment connections in all building closets to accommodate the new switch port configuration for data and voice switches;
- c. Reworking fiber backbone network connections to all buildings to balance dual feeders via redundant pathways.

3. History of the project or facility:

The network infrastructure and switches proposed for replacement under this project were installed between 1998 and 2000 under the Integrated Signal Distribution project (OFM Capital Project #1996-2-056). (See Appendix A – OFM reports CBS002 & CBS003)

4. University programs addressed or encompassed by the project:

The existing equipment will not support emerging industry standard protocols and technologies and has become an obstacle to implementing new network technologies to support developing academic programs at Western.

5. Significant Health, Safety, and Code Issues:

a. The project will make minor modifications to the existing physical support structures and electrical services for the equipment to bring the facility within current seismic and life safety requirements.

b. Applicable Standards and Codes:

- The new equipment and installation will be compliant with current standard network protocols, and regulatory standards for network equipment safety, electro magnetic compatibility (EMC), and TIA/EIA telecommunications building wiring standards. (See Appendix C)
- In addition, the selection of the equipment will emphasize energy efficiency and environmental standards.

6. Evidence of Failure/Ability to Defer Project:

Network Equipment

- The EOL notification on the software (July 2005), means that Western's equipment will not support emerging industry standard protocols and technologies. (See Appendix B)
- Hardware support from Cisco Systems is scheduled to be terminated on July 26, 2009. Replacement parts will not be available from the vendor and must be purchased from used market sources with a resulting lack of warranties and potential sub-standard performance.

Network Infrastructure

- The phased implementation of the campus fiber cabling infrastructure since the implementation of the ISDS project in 1998 and 1999 has created a condition where a disproportionate number of fibers are utilized over different routes. This project will balance the use of fibers over diverse and multiple routes to assure survivability of services if one or more pathways are compromised, and allow future projects to benefit from these diverse fiber routes.

7. Impact on Institutional Operations without the Infrastructure Project:

The Cisco 4003 switch line was developed in the 1990's. The existing switches do not support, or are incompatible with emerging network technologies such as:

- 10 Gigabit per second Ethernet;
- IPv6 (Internet Protocol Version 6);
- Quality of service (QoS) issues related to IP telephony and streaming video;
- Power over Ethernet (PoE) for IP phones, cameras, wireless access points, etc.;
- Network security verification of DHCP assigned IP addresses (DHCP snooping).

Quality replacement parts and Cisco technical support for the existing switches will be difficult to obtain or will no longer be available.

8. Reasonable Estimate:

Project estimate is provided in Appendix A with supporting material in Appendix D.

9. Engineering Study:

No engineering study is needed to verify the End of Life notification.

10. Supports Facilities Plan:

The network infrastructure's ability to dependably deliver technologies to students, faculty and staff is essential to the University's mission. Western's 2006 Strategic Plan states the following:

- Western provides students with a personalized teaching and learning environment of the highest quality.
- The University should enhance information resources, especially the library, and maintain technological currency to strengthen support for educational and scholarly activity.
- The University should ensure that maintenance programs sustain the beauty of the campus and the functionality of existing facilities.

A viable network infrastructure is essential to support the mission of the university.

Western's 1997 Draft Comprehensive Master Plan states that Western has a need to upgrade its signal infrastructure to provide the facilities through which both current and new technologies can be implemented. The implementation of these technologies is necessary not only to advance the educational process at the University, but also to support the structure that is required to fulfill the academic mission. Upgrades referenced in the 1997 Draft Comprehensive Plan did occur as part of the Integrated Signal Distribution System (ISDS) project described in earlier paragraphs. The proposed project updates that system. Western's Institutional Master Plan and facilities plans require that all new facilities and renovations tie into the network infrastructure.

11. Resource Efficiency and Sustainability:

The replacement of aging Cisco switches proposed by this project will conserve resources because newer switches are significantly more energy efficient. (See Appendix C) In addition, replacement switches will be more reliable than existing switches and decrease loss of service incidents as well as the 'end of life' service difficulties that are projected by the manufacturer. Reworking the existing fiber backbone network with this project will greatly increase the ability of the system to accept growth of critical new technological demands such as access control, security video, and IP telephony. This growth capability will decrease the cost of subsequent conversion projects and increase the efficiency of added new systems.

Network Infrastructure / Switches Appendix

- A. Office of Financial Management reports CBS002 & CBS003
- B. Cisco Systems End of Life Announcement
- C. Excerptions from Equipment Specifications
- D. Project Estimate

Appendix A

**380 - Western Washington University
Capital Project Request**

2009-11 Biennium

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Version: CP CPES Projects 09-11

Report Number: CBS002

Date Run: 8/14/2008 8:12AM

Project Number: 30000011

Project Title: Network Infrastructure/Switches

Schedule and Statistics

	<u>Start Date</u>	<u>End Date</u>
Construction	7/1/2010	10/1/2010
	<u>Total</u>	
Gross Square Feet:	0	
Usable Square Feet:	0	
Efficiency:		
Escalated MACC Cost per Sq. Ft.:	0	
Construction Type:	Other Non-Building Projects	
Is this a remodel?	No	
A/E Fee Class:	D	
A/E Fee Percentage:	0.00%	

Cost Summary

	<u>Escalated Cost</u>	<u>% of Project</u>
Acquisition Costs Total	0	0.0%
Consultant Services		
Pre-Schematic Design Services	0	0.0%
Construction Documents	200,307	4.2%
Extra Services	120,794	2.5%
Other Services	124,593	2.6%
Design Services Contingency	45,266	0.9%
Consultant Services Total	490,960	10.2%
Maximum Allowable Construction Cost(MACC)	3,246,738	
Site work	3,246,738	67.4%
Related Project Costs	0	0.0%
Facility Construction	0	0.0%
GCCM Risk Contingency	0	0.0%
GCCM or Design Build Costs	0	0.0%
Construction Contingencies	489,123	10.2%
Non Taxable Items	0	0.0%
Sales Tax	313,812	6.5%
Construction Contracts Total	4,049,673	84.1%
Equipment		
Equipment	0	0.0%
Non Taxable Items	0	0.0%
Sales Tax	0	0.0%
Equipment Total	0	0.0%
Art Work Total	0	0.0%

**380 - Western Washington University
Capital Project Request**

2009-11 Biennium

*

Version: CP CPES Projects 09-11

Report Number: CBS002

Date Run: 8/14/2008 8:12AM

Project Number: 30000011

Project Title: Network Infrastructure/Switches

Cost Summary

	<u>Escalated Cost</u>	<u>% of Project</u>
Other Costs Total	33,971	0.7%
Project Management Total	240,395	5.0%
Grand Total Escalated Costs	<u>4,814,999</u>	
Rounded Grand Total Escalated Costs	4,815,000	

Operating Impacts

No Operating Impact

Narrative

This project upgrades infrastructure enabling continued operations of the institution.

Cost Estimate Summary

2009-11 Biennium

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Cost Estimate Number: 8
 Cost Estimate Title: Network Infrastructure/Switches Cost Estimate
 Version: CP CPES Projects 09-11
 Project Number: 30000011
 Project Title: Network Infrastructure/Switches
 Project Phase Title:

Report Number: CBS003
 Date Run: 8/14/2008 8:13AM
 Agency Preferred: Yes

Contact Info Contact Name: Rick Benner Contact Number: 360.650.3550

Statistics

Gross Sq. Ft.: 0
 Usable Sq. Ft.: 0
 Space Efficiency:
 MACC Cost per Sq. Ft.: 0
 Escalated MACC Cost per Sq. Ft.: 0
 Remodel?
 Construction Type: Other Non-Building Projects
 A/E Fee Class: D
 A/E Fee Percentage: 0.00%

Schedule

	Start Date	End Date
Pre-design:		
Design:	09-2009	05-2010
Construction:	07-2010	10-2010
Duration of Construction (Months):	3	

Cost Summary Escalated

Acquisition Costs Total		0
Pre-Schematic Design Services		0
Construction Documents		200,307
Extra Services		120,794
Other Services		124,593
Design Services Contingency		45,266
Consultant Services Total		490,960
Site work		3,246,738
Related Project Costs		0
Facility Construction		0
Construction Contingencies		489,123
Non Taxable Items		0
Sales Tax		313,812
Construction Contracts Total		4,049,673
Maximum Allowable Construction Cost(MACC)	3,246,738	
Equipment		0
Non Taxable Items		0
Sales Tax		0
Equipment Total		0
Art Work Total		0
Other Costs Total		33,971
Project Management Total		240,395
Grand Total Escalated Costs		4,814,999
Rounded Grand Total Escalated Costs		4,815,000

Additional Details

Alternative Public Works Project: No

Cost Estimate Summary

2009-11 Biennium

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Cost Estimate Number: 8
Cost Estimate Title: Network Infrastructure/Switches Cost Estimate
Version: CP CPES Projects 09-11
Project Number: 30000011
Project Title: Network Infrastructure/Switches
Project Phase Title:

Report Number: CBS003
Date Run: 8/14/2008 8:13AM
Agency Preferred: Yes

Contact Info **Contact Name:** Rick Benner **Contact Number:** 360.650.3550

Additional Details

State Construction Inflation Rate: 3.50%
Base Month and Year: 03-2008
Project Administration By: AGY
Project Admin Impact to GA that is NOT Included in Project Total: \$0

Cost Estimate Detail

2009-11 Biennium

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Cost Estimate Number: 8 Analysis Date: July 24, 2008
 Cost Estimate Title: Network Infrastructure/Switches Cost Estimate
 Detail Title: Network Infrastructure/Switches
 Project Number: 30000011
 Project Title: Network Infrastructure/Switches
 Project Phase Title:
 Location: Bellingham
 Contact Info Contact Name: Rick Benner Contact Number: 360.650.3550

Statistics

Gross Sq. Ft.:
 Usable Sq. Ft.:
 Rentable Sq. Ft.:
 Space Efficiency:
 Escalated MACC Cost per Sq. Ft.:
 Escalated Cost per S. F. Explanation

Construction Type: Other Non-Building Projects
 Remodel? No
 A/E Fee Class: D
 A/E Fee Percentage: 0.00%
 Contingency Rate: 10.00%
 Contingency Explanation

Management Reserve: 5.00%
 Projected Life of Asset (Years):
 Location Used for Tax Rate: Bellingham
 Tax Rate: 8.40%
 Art Requirement Applies: No
 Project Administration by: AGY
 Higher Education Institution?: Yes
 Alternative Public Works?: No

Project Schedule

Start Date End Date

Pre-design:
 Design: 09-2009 05-2010
 Construction: 07-2010 10-2010
 Duration of Construction (Months): 3
 State Construction Inflation Rate: 3.50%
 Base Month and Year: 3-2008

Project Cost Summary

MACC: \$ 2,996,251
 MACC (Escalated): \$ 3,246,738
 Current Project Total: \$ 4,464,395
 Rounded Current Project Total: \$ 4,464,000
 Escalated Project Total: \$ 4,814,999
 Rounded Escalated Project Total: \$ 4,815,000

<u>ITEM</u>	<u>Base Amount</u>	<u>Sub Total</u>	<u>Escalation Factor</u>	<u>Escalated Cost</u>
CONSULTANT SERVICES				
<u>Construction Documents</u>				
A/E Basic Design Services	188,046			
SubTotal: Construction Documents		188,046	1.0652	200,307
<u>Extra Services</u>				
Commissioning (Systems Check)	6,000			
Site Survey	12,000			
Testing	18,000			
Hazmat Consultant	18,000			
Travel & Per Diem	18,000			
Document Reproduction	3,000			
Advertising	2,400			
Third Party Cost Consultant	24,000			
As-Built Services	12,000			
SubTotal: Extra Services		113,400	1.0652	120,794
<u>Other Services</u>				
Bid/Construction/Closeout	84,484			
Commissioning & Training	12,000			
On-Site Construction Representative	18,000			
SubTotal: Other Services		114,484	1.0883	124,593
<u>Design Services Contingency</u>				
Design Services Contingency	41,593			
SubTotal: Design Services Contingency		41,593	1.0883	45,266
Total: Consultant Services		457,523	1.0731	490,960
CONSTRUCTION CONTRACTS				
<u>Site work</u>				
Total Construction	2,996,251			
SubTotal: Site work		2,996,251	1.0836	3,246,738
Maximum Allowable Construction Cost (MACC)		2,996,251	1.0800	3,246,738
<u>Construction Contingencies</u>				
Management Reserve	149,813			
Allowance for Change Orders	299,625			
SubTotal: Construction Contingencies		449,438	1.0883	489,123
Sales Tax		289,438	1.0842	313,812
Total: Construction Contracts		3,735,127	1.0842	4,049,673
OTHER COSTS				
In-Plant Services	31,350			
Total: Other Costs		31,350	1.0836	33,971
PROJECT MANAGEMENT				
Agency PM Fee	240,395			
Total: Project Management		240,395	1.0000	240,395

Appendix B

Appendix B

Cisco Systems® announces the end of life of the Cisco® Catalyst® 4003 chassis (WS-C4003-S1), Cisco Catalyst 4000 Supervisor Engine I

(WS-X4012), Cisco Catalyst 4000/4500 Supervisor Engine III (WS-X4014), Cisco IOS® Software Release 12.1(12c)EW, and associated bundles. The end-of-life milestones, definitions, and dates are separated in to two sections: Table 1a and 2a.

The end-of-life Cisco Catalyst product bundles that contain DC power supplies (Table 2a) have been extended 9 months. Table 2b lists the affected product IDs. For all other end-of-sale Cisco Catalyst 4000/4500 products in this product bulletin, please refer to Tables 1a and 1b.

Cisco Catalyst 4003 and Cisco Catalyst 4000 Supervisor Engine I customers are encouraged to migrate to the Cisco Catalyst4503 with Supervisor Engine II-Plus, which provides nonblocking Layer 2 switching, basic Layer 3 routing, comprehensive Layer 3-4 security, and QoS at up to 64 Gbps and 48 Mpps.

Cisco Catalyst 4000/4500 Supervisor Engine III customers are encouraged to migrate to the Cisco Catalyst 4000/4500 Supervisor Engine IV, which includes the same features and functions as the Supervisor Engine III, plus additional enhancements at a lower price.

Cisco IOS Software Release 12.1(12c)EW customers are encouraged to migrate to Cisco IOS Software Release 12.2(25)EWA2 or later. These releases support additional hardware and software features.

For more information about the Cisco Catalyst 4503, Supervisor Engine II-Plus, and Supervisor Engine IV, go to: <http://www.cisco.com/en/US/products/hw/switches/ps4324/index.html>

Table 1a. End-of-Life Milestones and Dates including the Cisco Catalyst 4003, Catalyst 4000 Supervisor Engine I, Catalyst 4000/4500 Supervisor Engine III, and Cisco IOS Software Release 12.1(12c)EW. Please see Table 1b for the complete list of products.

Milestone	Definition	Date
End-of-Life Announcement Date	The date the end of sale and end of life of a product is announced to the general public.	January 26, 2004
End-of-Sale Date	The last date to order the product through Cisco point-of-sale mechanisms. The product is no longer for sale after this date	July 26, 2004
Last Shipment Date	The last-possible date that Cisco and/or its contract manufacturers will ship the affected product.	September 30, 2004
End of Software Maintenance Releases Date	The last date that Cisco Engineering may release any final software maintenance releases or bug fixes. After this date, Cisco Engineering will no longer develop, repair, maintain, or test the product software.	July 26, 2005
End of Routine Failure Analysis Date	The last possible date a routine failure analysis may be performed to determine the cause of product failure or defect.	July 26, 2005

End of New Service Attachment Date	For equipment and software that is not covered by a service-and-support contract, this is the last date to order a new service-and-support contract or add the equipment and/or software to an existing service-and-support contract.	July 26, 2005
End of Service Contract Renewal Date	The last date to extend or renew a service contract for the product. The extension or renewal period cannot extend beyond the last date of support.	July 26, 2008
Last Date of Support	The last date to receive service and support for the product. After this date, all support services for the product are unavailable and the product becomes obsolete.	July 26, 2009

Table 1b. Product Part Numbers Associated to Table 1a

End-of-Sale Product Part Number	Product Description
WS-X4012=	Catalyst 4000 Supervisor Engine I, Console (DB-25)/Mgt. (RJ-45) (Spare)
WS-X4014	Catalyst 4000/4500 Supervisor Engine III (2 GE), Console (RJ45)
WS-X4014=	Catalyst 4000/4500 Supervisor Engine III (2 GE), Console (RJ45) (Spare)
WS-C4003-S1	Catalyst 4000 Chassis (3-slot), Supervisor Engine1 AC P/S, Fan Tray
WS-C4003-S1-82	Catalyst 4003 Chassis, AC P/S, Supervisor Engine I, 80 10/100 FE + 2 GE
WS-C4003=	Catalyst 4000 Chassis (3-slot), Single AC Power Supply (Spare)
WS-C4006-S3*	Catalyst 4000 Chassis (6-slot), Supervisor Engine III with 2 GE, 2 AC P/S, Fans
S4KL3-12112EW	Cisco IOS Software Basic Layer 3 Catalyst 4000/4500 Supervisor Engine III and Supervisor Engine IV (RIP, St. Routes, IPX, AppleTalk)
S4KL3-12112EW=	Cisco IOS BASIC L3 Cat4000 SUP III/IV (RIP, St. Routes, IPX, AppleTalk)
S4KL3E-12112EW	Cisco IOS ENHANCED L3 Cat4000 SUP III/IV (OSPF, IGRP, EIGRP)
S4KL3E-12112EW=	Cisco IOS ENHANCED L3 Cat4000 SUP III/IV (OSPF, IGRP, EIGRP)

* Cisco is not announcing end of sale for the Cisco Catalyst 4006 Switch as part of this bulletin. This bulletin pertains only to the Catalyst 4006 bundle that includes Cisco Catalyst 4000/4500 Supervisor Engine III.

Table 2a. End-of-Life Milestones and Dates for WS-C4003-S1-DC and WS-C4006-S3-DC.
 Please refer to Table 2b for more information on the related products.

Milestone	Definition	Date
End-of-Life Announcement Date	The date the end of sale and end of life of a product is announced to the general public.	January 26, 2004
End-of-Sale Date	The last date to order the product through Cisco point-of-sale mechanisms. The product is no longer for sale after this date.	May 3, 2005
Last Shipment Date	The last-possible date that Cisco and/or its contract manufacturers will ship the affected product.	August 3, 2005
End of Software Maintenance Releases Date	The last date that Cisco Engineering may release any final software maintenance releases or bug fixes. After this date, Cisco Engineering will no longer develop, repair, maintain, or test the product software.	May 3, 2006
End of Routine Failure Analysis Date	The last possible date a routine failure analysis may be performed to determine the cause of product failure or defect.	May 3, 2006
End of New Service Attachment Date	For equipment and software that is not covered by a service-and-support contract, this is the last date to order a new service-and-support contract or add the equipment and/or software to an existing service-and-support contract.	May 3, 2006
End of Service Contract Renewal Date	The last date to extend or renew a service contract for the product. The extension or renewal period cannot extend beyond the last date of support.	May 3, 2009
Last Date of Support	The last date to receive service and support for the product. After this date, all support services for the product are unavailable and the product becomes obsolete.	May 3, 2010

Table 2b. Product Part Numbers Associated to Table 2a

End-of-Sale Product Part Number	Product Description
WS-C4003-S1-DC	Catalyst 4000 Chassis (3-slot), Supervisor Engine I, 1 DC P/S, Fans
WS-C4006-S3-DC	Catalyst 4000 Chassis (6-slot), Supervisor Engine III with 2 GE, 2 DC P/S, Fans

PRODUCT MIGRATION OPTIONS

The recommended replacement for the Cisco Catalyst 4003 chassis with Catalyst 4000 Supervisor Engine I is the Cisco Catalyst 4503 with Supervisor Engine II-Plus.

For a list of benefits of the Cisco Catalyst 4503, please visit:

http://www.cisco.com/en/US/products/hw/switches/ps4324/products_data_sheet0900aecd8017a0c5.html

Table 3 provides information for migrating from the Cisco Catalyst 4003 chassis with Supervisor Engine I.

Table 3. Cisco Catalyst 4003 Chassis & Catalyst 4000 Supervisor Engine I Replacement Products

End of Sale Product Part Number	Deployed With	Replacement Product Numbers
WS-C4003-S1	Cisco Catalyst 4000 and Catalyst 4500 series line cards	<ul style="list-style-type: none"> • WS-C4503, WS-C4506, or WS-C4507R • WS-X4013+ or WS-X4515 • PWR-C45-1000AC
WS-C4003-S1-DC	Cisco Catalyst 4000 and Catalyst 4500 series line cards	<ul style="list-style-type: none"> • WS-C4503, WS-C4506, or WS-C4507R • WS-X4013+ or WS-X4515 • PWR-C45-1400DC-P

The recommended replacement for the Cisco Catalyst 4000/4500 Supervisor Engine III is the Cisco Catalyst 4000/4500 Supervisor Engine IV. The Catalyst 4000/4500 Supervisor Engine IV is compatible with all Catalyst 4500 Series chassis, power supplies, and existing Catalyst 4000 Series line cards.

For a list of benefits of the Cisco Catalyst 4000/4500 Supervisor Engine IV, go to:

http://www.cisco.com/en/US/prod/collateral/switches/ps5718/ps4324/product_data_sheet0900aecd8035cf2b.html

Table 4 provides information for migrating from the Cisco Catalyst 4000/4500 Supervisor Engine III.

Table 4. Cisco Catalyst 4000/4500 Supervisor Engine III Replacement Products

End of Sale Product Part Number	Deployed with	Replacement Product Numbers
WS-X4014	Cisco Catalyst 4503, 4506, or 4006 chassis	WS-X4515

The recommended replacement for Cisco IOS Software Release 12.1(12c)EW is Cisco IOS Software Release 12.2(25)EWA2 or later. These releases support additional hardware and software features. Customers can use the Cisco Technology Migration Plan (TMP) to trade in products and receive credit toward the purchase of new Cisco equipment. For more information about Cisco TMP, go to:

<http://www.cisco.com/go/tradein/>

The Cisco TMP application requires that all users have a Cisco.com user ID.

Appendix C

Appendix C

Excerpted from Equipment Specifications for Cisco Catalyst 4500 Series Chassis:

Standard Network Protocols

- Ethernet
 - IEEE 802.3, 10BASE-T
- Fast Ethernet
 - IEEE 802.3u, 100BASE-TX
 - IEEE 802.3, 100BASE-FX
- Gigabit Ethernet
 - IEEE 802.3z
 - IEEE 802.3x
 - IEEE 802.3ab
- 1000BASE-X (GBIC)
 - 1000BASE-SX
 - 1000BASE-LX/LH
 - 1000BASE-ZX
- VLAN trunking and tagging
 - IEEE 802.1Q
 - IEEE 802.3ad
- Spanning Tree Protocol
 - IEEE 802.1D
 - IEEE 802.1w
 - IEEE 802.1s
- Security
 - IEEE 802.1x
- Power over Ethernet (PoE)
 - IEEE 802.3af

Table 9. Regulatory Standards Compliance

Specification	Standard
Regulatory Compliance	CE Marking
Safety	<ul style="list-style-type: none"> • UL 60950 • CAN/CSA-C22.2 No. 60950 • EN 60950 • IEC 60950 • TS 001 • AS/NZS 3260
EMC	<ul style="list-style-type: none"> • FCC Part 15 (CFR 47) Class A • ICES-003 Class A • EN55022 Class A • CISPR22 Class A • AS/NZS 3548 Class A • VCCI Class A • EN 55022 • EN 55024 • EN 61000-6-1 • EN 50082-1 • EN 61000-3-2 • EN 61000-3-3 • ETS 300 386
Industry EMC, Safety, and Environmental Standards	<ul style="list-style-type: none"> • NEBS Level 3 • ETS 300 019 Storage Class 1.1 • ETS 300 019 Transportation Class 2.3 • ETS 300 019 Stationary Use Class 3.1 • ETS 300 386
Telecom (E1)	<ul style="list-style-type: none"> • CTR 12/13 • CTR 4 • ACA TS016
Telecom (T1)	<ul style="list-style-type: none"> • FCC Part 68 • Canada CS-03 • JATE Green Book

From the TIA/EIA web page

http://www.tiaonline.org/standards/catalog/search.cfm?standards_criteria=TIA/EIA-568

TIA/EIA-568-B.1-1 (May 2001)

Commercial Building Telecommunications Cabling Standard - Part 1: General Requirements - Addendum 1 - Minimum 4-Pair UTP and 4-Pair ScTP Patch Cable Bend Radius (ANSI/TIA/EIA-568-B.1-1-2001)

Appendix D

W.W.U. PRELIMINARY COST ESTIMATE

Project: 2009 - 2011 Capital Project Request
 Project Name : Network Infrastructure and Switches
 Estimated by : Telecommunications Services
 Date : 24-Dec-07

Scope of Estimate : New Network Switches, including installation and related labor and materials

Item #	Description	q.t.y.	Mat. Cost	Unit	Material Total	Labor Un.	Unit	L:
1	Cisco Catalyst 4503 Network Switches	148	\$ 14,369.55	1	\$2,126,693.03	0.00	1	
2	Receive and Configure Switch in Shop	148	\$0.00	1	\$0.00	5.00	1	
3	Install switch in rack	148	\$0.00	1	\$0.00	1.50	1	
4	Hydra Equipment Cable, 24 ports	592	\$340.00	1	\$201,280.00	4.00	1	
5	Hydra Equipment Cable, 12 ports	148	\$224.00	1	\$33,152.00	3.00	1	
6	sm/mm Patch cords	148	\$120.00	1	\$17,760.00	1.50	1	
7	New Equipment Termination Field (two 300 blocks)	148	\$240.00	1	\$35,520.00	1.00	1	
8	Migration between old and new fields, Premium Labor	148	\$0.00	1	\$0.00	6.00	1	
9	Channel Testing of existing horiz cabling, 60/p switch	148	\$0.00	1	\$0.00	3.50	1	
10	Remove Old Switches (estimated trade-in value)	148	(\$180.00)	1	(\$26,640.00)	1.50	1	
11	Re-route fiber connections to redundant paths	170	\$540.00	1	\$91,800.00	1.00	1	
12		0	\$0.00	1	\$0.00	0.00	1	

Ttl. Labor Units :

* Labor rates based on L&I Prevailing Wage Rates Plus contractor Overhead & Profit

Contractor Labor Rate/Hr*: \$50

Labor Cost :

Materials Total: \$2,479,565.03

Tax @: 8.4% \$208,283.46

Material Cost: \$2,687,848.49 -----> \$2

TOTAL PROJECT COST (MACC, No Inflation): - \$2

Pricing for Cisco Catalyst 4503 Network Switch

24-Dec-07

Product	Description	Quantity	List Price		DIS Contract*	Extended Price
			Each			
WS-C4503	Catalyst 4500 Chassis (3-Slot),fan, no p/s	1	\$ 1,094.50	\$ 651.23	\$ 651.23	\$ 651.23
PWR-C45-1300ACV	Catalyst 4500 1300W AC Power Supply (Data and PoE)	1	\$ 1,644.50	\$ 978.48	\$ 978.48	\$ 978.48
PWR-C45-1300ACV/2	Catalyst 4500 1300W AC Power Supply (Data and PoE)	1	\$ 1,644.50	\$ 978.48	\$ 978.48	\$ 978.48
CAB-7513AC	AC POWER CORD NORTH AMERICA (110V)	4	\$ -	\$ -	\$ -	\$ -
WS-X4013+TS	Catalyst 4503 SupII-Plus-TS, 12 10/100/1000 PoE+8 SFP slots	1	6,594.50	\$ 3,923.73	\$ 3,923.73	\$ 3,923.73
S4KL3K9-12225EWA	Cisco IOS BASIC L3 Cat4500 SUP2+/4/5,3DES	1	\$ -	\$ -	\$ -	\$ -
WS-X4306-GB	Catalyst 4500 Gigabit Ethernet Module, 6-Ports (GBIC)	1	\$ 3,294.50	\$ 1,960.23	\$ 1,960.23	\$ 1,960.23
WS-X4448-GB-RJ45	Catalyst 4500 48-Port 10/100/1000 Module (RJ45)	1	\$ 6,594.50	\$ 3,923.73	\$ 3,923.73	\$ 3,923.73
WS-G5486	1000BASE-LX/LH long haul GBIC (singlemode or multimode)	3	\$ 1,094.50	\$ 651.23	\$ 1,953.68	\$ 1,953.68
Total Price for Single Switch:						\$ 14,369.55

* DIS Master Contract T06-

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http://techmall.dis.wa.gov/master_contracts/cisco/t06mst001.pdf